



The non-local parameterization of turbulent exchange: numerical analysis.

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In this research we consider the situation when the characteristic size of inhomogeneities of the average concentration of gas-aerosol impurity is comparable with the characteristic size of turbulent "moles". Such situations have a place most likely, when we conduct research the dispersion of gas-aerosol in the Earth's atmosphere under normal conditions. At present, the mathematical modeling of dispersion of gas-aerosol impurity in a turbulent atmosphere with help the local parameterization is used. In this case it is assumed, that the turbulent flux is proportional to the average concentration of gas-aerosol impurity. However, there is no physical circumstance because of which, one would assume that such a representation of the turbulent flow is suitable when the characteristic size of turbulent moles of comparable or greater than the characteristic size of the heterogeneity of concentration of gas-aerosol impurity.

In this research it is proposed the a simple model of nonlocal parameterization of turbulent exchange for those situations when the characteristic size of inhomogeneities average concentrations of gas-aerosol impurity is comparable with the characteristic scale of turbulent "moles". We considered several situations about dispersion of gas-aerosol impurity for local formations in the turbulent atmosphere with help a numerical analysis of processes of dispersion of the gas-aerosol formations. It is proved that the use of non-local parameterization of turbulent exchange leads to the correct results.

Our analysis shows that in all situations when the characteristic size of inhomogeneities of the average concentration of gas-aerosol impurity less than or comparable with the characteristic size of turbulent "moles" should be use the scheme of non-local parameterization of turbulent exchange.